

RGEG Position Evaluation Report

Researcher: Dr. Ron H. Lyle

Peer Group: Advanced Instrumentation and Sensors Systems

Summary Scores

Factor I – Research Assignment	Factor II – Supervision Received	Factor III – Guidelines and Originality	Factor IV – Qualifications and Contributions
E	E	E+	E

Total Score: 52, ST pool

Grade Conversion: GS-15

Factor I – Research Assignment

The panel assigned Degree E for this factor because:

The broad scope and high level of complexity of the incumbent's research assignment merit this rating.

Leadership activities are well covered in the package and were expanded on by the contacts. These include formulating and guiding a research attack on exceptionally difficult and formerly unyielding problems in applied research which have been recognized as critical obstacles to progress. For example, Dr. Lyle was instrumental in establishing the field of Modal Acoustic Emissions (AE) analysis, and he is credited with being instrumental in initiating and advocating for recent Integrated Vehicle Health Monitoring (IVHM) work within his branch and leading efforts spanning multiple organizations and programs, confirmed by interviews. Several other contacts also cited his leadership and multi-organizational team building.

Factor II – Supervision Received

The panel assigned Degree E for this factor because:

He requires minimal supervision and is considered as the leading authority within his organization in his technical areas. He has broad delegated authority and can advocate for and commit to new work in his area of expertise.

Dr. Lyle has considerable latitude to make decisions and set the course of research activities, limited primarily by availability of branch personnel resources and other organizational commitments, as confirmed by interviews. He has authority to make recommendations and commitments both to other Langley and NASA organizations, as well as outside organizations as confirmed by interviews. Interviewees indicated that Dr. Lyle's competence in Modal AE work is at such a level that no one in the organization is able to provide significant technical guidance on this topic. It was confirmed that he has virtually complete freedom in setting research goals and directions.

Factor III – Guidelines and Originality

The panel assigned Degree E+ for this factor because:

He is considered not only a leading authority in his field, but is considered the originator of complete new areas with high value and broad applications, and has expanded the state of knowledge and influenced accepted practices in several areas.

Dr. Lyle is credited by multiple sources with originating the field of Modal Acoustic Emissions (AE) and applications in IVHM. Interviews indicated that his work has opened up new areas of research.

Several sources confirmed the statements that previous knowledge in the field of IVHM was limited. Other sources stated that he is not only a recognized authority in Modal AE analysis, but credited him with pioneering the discipline in which both he and a substantial portion of his branch are engaged. The creation of a successful new business, Digital Wave Corporation, based on his innovations is one notable example. Other examples include the use of tunable fiber optic laser technology in sensor systems, and multi-dimensional analysis methods.

There are numerous examples of demonstrated originality confirmed by contacts who also cited additional examples. One contact stated that his own work had been influenced by Dr. Lyle's multi-dimensional analysis approach for arrays of acoustic emissions. Another cited his contributions in application of finite element modeling to plates and experimental verification of the results as a significant advance in the field. Two others cited his work as key to the area in which their company is working, and supported his stature as an internationally recognized expert.

Dr. Lyle's research has opened up new areas of research for exploration and the findings have had widespread applicability to their fields of science and technology (such as monitoring structural integrity of bridges, and oil tanks).

Factor IV – Qualifications and Contributions

The panel assigned Degree E for this factor because:

His accomplishments have resulted in national and international recognition and his innovations have been widely adopted and commercialized.

Dr. Lyle has had major impact in extending the state of knowledge in the area, according to interviews. Dr. Lyle has had numerous significant accomplishments:

- Application of sensor technologies to aerospace vehicles
- Guided acoustic wave models and analysis methods
- Improvements in AE source location accuracy
- Techniques for prediction of acoustic wave propagation in bounded solids
- Validation of applications of Dynamic Finite Element Method (DFEM) to acoustic waves in plates
- Development of digital waveform based AE measurement systems
- Multiplexing system for AE data acquisition

Dr. Lyle's research has been recognized and validated through its applications to numerous real-world problems, his selection as a reviewer for numerous national and international publications, and his participation in various professional societies. Specific examples cited by references included the founding of the new publication "Structural Health Monitoring: An International Journal" initiated by the publisher based on his innovations, and the canceling by the Air Force of their own research efforts in vehicle monitoring due to the more advanced nature of Dr. Lyle's work. Contacts confirmed: his expertise in AE and cited his key role (and particularly his hard work and dedication) in the successful IVHM program for the X-33 project, commercial applications of his work in the oil industry, the impact of his work in plate theory and applications and in the X-33 program. Numerous contacts supported his national and international stature as an authority in his field. Some also emphasized his international recognition as an invited presenter at conferences, and as a reviewer. He is the holder of three patents and has three additional invention disclosures.

References confirmed Dr. Lyle's mentorship of students, post-docs, and junior employees. His leadership capabilities, hard work, and ability to work well with diverse groups were mentioned by several contacts. He has been the recipient of numerous awards, honors, and the NASA Floyd Thompson Fellowship as confirmed by both references and web searches.

General comments:

The RDCP package was very well prepared and addressed all required areas. Comments by contacted references were universally positive and confirmed, complemented, and extended his assertions in the write-up. He was credited with outstanding dedication, originality, team building, leadership, organizational, and technical abilities.

Panel recommends referral to the ST pool.